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10/588,466	05/17/2007	Laurent Marc Philippe	M03B171	8739

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EXAMINER	
PAUL, ANTONY M	
ART UNIT	**PAPER NUMBER**
2837	

NOTIFICATION DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	**Application No.** 10/588,466	**Applicant(s)** PHILIPPE ET AL.	
	Examiner ANTONY M. PAUL	**Art Unit** 2837	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 July 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 thru 19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1 thru 5 and 7 thru 19* is/are rejected.

7)☒ Claim(s) *6* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *20 July 2010* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections – 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-5, 7, 8 and 12-19 are rejected under 35 U.S.C. 102(b) as being anticipated by Sasaki et al. (6,244,825).

Claims:	**Sasaki et al. teaching:**
Claim 1: A pumping system comprising:	A pumping apparatus 12/39/46/62 (see figs.1-6, 8-11) comprising:
a pumping mechanism;	a vacuum pump 14;
a motor for driving the pumping mechanism;	a motor 16 drives the pump 14 (figs.1, 5);
a drive control for controlling the motor; and	the control device 10/38 (or control means 20, figs.1, 5) controls the motor 16;
means for monitoring at least one state within the system;	power detector 18 monitor the power consumption of the motor 16 of the pumping apparatus 12/39 (see col. 3, lines 3-6; voltage/current, see col. 7, lines 50-54; detecting power consumption state corresponding to speed state R, see figs.4, 6, or Speed state R via speed detection 64, see fig.11);
wherein the drive control causes the system to operate for transient periods in an overload condition and	control means 20 causes the said pumping apparatus to operate in an overloading condition such as when the power consumption is being equal to or greater

	than a predetermined value (vacuum pump becomes overloaded, see col. 4, lines 12-19; high speed operation R2 causes the power consumption to increase above the highest load region (shown as warning/alarm zone B, see fig. 4); opening control of a pump valve 34 (fig.2) cause the power consumption W to increase to a higher level (power consumption increased to point E or any increased level with corresponding higher speed R4, see fig.6 & col. 6, lines 5-11) and transient periods in an overload condition read on to the time periods t (fig.6) associated with the power consumption W being greater than a predetermined value set by the controller 24 of the control means 20 (predetermined period of time associated with the power consumption being greater than the predetermined value i.e., in the overload condition is set by the controller 24; see col. 3, lines 35-45) and
to control the power to the motor when the system is operating in said overload condition dependent on the level of said monitored state so as to avoid said state from exceeding said operational limit.	when the pumping apparatus 12/39 have an overload condition such as when the power consumption being equal to or greater than a predetermined value, the control means 20 controls the power supplied to the motor 16 based on detecting the power consumption level W via the power detector 18 (see figs.1, 5, 6) and (the level of said monitored state read on to any power consumption level W corresponding to a speed operating point R3/R4, see fig.6) the higher power consumption level W (corresponding to higher speed R4) is shown controlled so as not to exceed the higher power consumption point E (or any higher power consumption level W corresponding to high speed operating point R4) by adjusting the speed of the pump motor 16 to attain the lowest speed R3; the power

	consumption is controlled so as not to exceed above the highest load, i.e., the said warning zone B, by decreasing the speed of the motor 16 to a lower level R1; see fig.4 & col. 4, lines 5-32). In general, to avoid said state from exceeding said operational limit depends upon the predetermined value set by the controller.
Claim 2: The system according to claim 1, wherein the performance is improved by said drive control increasing the power supplied to the motor to a level which can result in said monitored state exceeding a predetermined operational limit.	Read on to the improved pumping apparatus 12 as Sasaki et al. teaches protection of the pumping apparatus 12 by power detection, controlling the power consumption of the pump motor 16 by adjusting the speed (see figs. 4, 6 & col. 3, lines 51-57; improvement in operating efficiency, see col. 5, lines 21-52; service life is extended, see col. 8, lines 19-21) and control means 20 increases the power consumption level W of the motor 16 corresponding to a higher speed R4 and fig. 6 shows a speed state exceeding a lower speed level R3 associated with an increase in power consumption to an operation point E (see fig. 6) or fig. 4 shows power consumption exceeds a reference value (towards zone B) corresponding to a higher speed R2.
Claim 3: The system according to Claim 1, wherein the drive control causes the system to operate in an overload condition when a load on the motor requires increased power supply to the motor.	Control means 20 cause the pumping apparatus 12 to operate in an overload condition such as when the power consumption W of the load such as the pump 14 received by the motor 16 is greater than a predetermined value (power consumption W is high in the corresponding high speed operation R4 of the motor, see figs. 4, 6).
Claim 4: The system according to claim 1, wherein the drive control does not limit said power unless said state exceeds a predetermined lower limit.	Control means 20 limiting power depends upon the power consumption of the motor 16. Fig.4 shows power consumption restricted to a lowered state (towards point D) where

	speed just exceeded a lower limit R1.
Claim 5: The system according to claim 4, wherein above said predetermined lower limit, said drive control gradually varies power dependent on said monitored state.	Fig. 4 shows a gradual increase of power consumption (towards point A) associated with the gradual increase of speed above a predetermined lower speed limit R1, where the control means 20 variably adjust the power based on speed detection 64 (fig.11).
Claim 7: The system according to claim 1, wherein the drive control controls the power of the motor by limiting the current supplied to the motor by adjusting the voltage supplied to the motor.	Control means 20 (via inverter 22) adjust the power supplied to the motor 16 and Sasaki et al. teaches that an inverter 22 changes voltage or current (see col. 7, lines 65-67). Limiting current read on to limiting power consumption to a lower state (corresponding to a lower speed state, see figs.4, 6).
Claim 8: The system according to claim 7, wherein the drive control comprises programmable means for setting a maximum allowable current in said motor so as to the extent to which the system can be overloaded.	Control means 20 includes a programmable means such as the controller 24, which preset maximum current value such as the maximum power consumption value of the motor 16 (see col. 4, lines 12-24) and when equal to or greater than this value, the pumping system 12 is in an overloaded state (higher power consumption associate with overloading is shown in fig.6).
Claim 12: The system according to claim 1, wherein said monitored state within the system is selected from the group of parameters comprising a pressure, a current, a voltage, an impedance, or a temperature.	Monitored state read on to the power consumption of the motor 16 using the power detector 18 of the apparatus 12 (sensing voltage/current, see col.7, lines 50-56) (or sensing impedance read on to detecting a load of the motor, see col. 8, lines 2-3).
Claim 13: The system according to claim 1, wherein the drive control comprises means for receiving input from a sensor for monitoring the at least one state within the system, and when the drive control causes the system to operate for transient periods in an overload condition	Control means 20 includes a controller 24, which receive power detections information from a sensor such as the power detector18 (alternatively a torque detector 58 or a speed detector 64, see figs 10-11), (overloading time periods shown in fig.6 associated with higher power consumption corresponding to higher speed of the motor 16)

the power to the motor is controlled to avoid the at least one state from exceeding the predetermined operational limit.	Figs. 4-6 shows power consumption of the motor 16 is controlled by control means 20 (via inverter 22) based on power consumption (via detection 18, fig. 1) exceeding a value set by controller 24. Fig. 4 shows power consumption not to exceed a power consumption warning zone B or not to go above an allowable load (or fig. 6 shows power not to exceed a power consumption point E).
Claim 14: The system according to claim 13, wherein the sensor is for sensing a parameter selected from the group comprising gas pressure, temperature, voltage, or impedance within the system.	Pumping apparatus 12 includes a sensor such as the power detector 18 sensing voltage (col.7, lines 50-56) (or sensing impedance read on to detecting a load of the motor (see col. 8, lines 2-3).
Claim 15: The system according to claim 1, wherein the drive control comprises a variable speed drive for controlling the power to the motor dependent on the level of said monitored state thereby avoiding said state from exceeding said operational limit.	Drive control 10/20 includes a variable speed drive such as the controller 24 (controller controls the power consumption of the motor 16 by varying the speed, see col. 3, lines 26-33, col. 4, lines 5-61). Power consumption level W (fig.6) is monitored via power detection 18 (fig.1) and power consumption is controlled not to exceed an operation point by controlling the speed level (see figs. 4-6 and explanation in claim 1).
Claim 16: The system according to claim 1, wherein the drive control comprises analogue means for controlling the power to the motor dependent on the level of said monitored state thereby avoiding said state from exceeding said operational limit.	Control means 20 includes an analogue means such as the inverter 22 (or controller 24 as an analogue circuit, see col. 8, lines 4-6) for controlling the power supplied to the motor 16, where the power consumption level [W] depend on the speed R (fig.6) and other limitations are explained in claim 1.
Claim 17: The system according to claim 1, wherein the drive control is operable to prevent said system from operating in an overload condition.	Control means 20 adjust the power supplied to the pump motor 16 by controlling the speed of the pump motor 16 (figs 4-6) so as to prevent the overloading of the motor 16 or the pumping apparatus 12.
Claim 18: The system according to claim 1, wherein said pumping mechanism is a vacuum pumping mechanism.	Vacuum pumping mechanism 14 (figs.1-2).

Claim 19: A method of controlling a pumping system comprising:	Sasaki et al. teaches a method of control of a pumping apparatus12/39/46/62 (Figs. 1-6 and 8-11) comprising:
a pumping mechanism; a motor for driving the pumping mechanism; and a drive control for controlling the power to the motor,	Limitations are explained in claim 1.
wherein said method comprises improving the performance of the system	Read on to the improved said pumping apparatus as Sasaki et al. teaches protection of the said pumping apparatus by power detection 18 (figs.1, 5), controlling the power consumption W of the pump motor 16 by adjusting the speed R of the motor 16 (see figs. 4, 6 & col. 3, lines 51-57; improvement in operating efficiency, see col. 5, lines 21-52; service life is extended, see col. 8, lines 19-21) and
by causing the system to operate for transient periods in an overload condition which can cause a monitored state to exceed a predetermined operational limit, and,	High speed operationR2/R4 (figs.4, 6) causes the pump 14 of the said pumping apparatus to be in an overloaded condition such as when the power consumption level W being detected (fig. 6) is equal to or greater than a predetermined value set by the controller 24 of the control means 20; high speed operating point R2 cause the power consumption to be above the highest load, i.e., associated with the warning or alarm zone B as in fig.4 (transient periods read on to the predetermined time periods associated with the overload condition and is set by the controller 24 of the control means 20, See detailed explanation in claim 1).
when operating in said overload condition, controlling the power to the motor dependent on the level of said monitored state thereby avoiding said state from exceeding said operational limit.	Control means 20 (via inverter 22, figs.1/5) control the power provided to the motor 16 based on detection of the power consumption level W (figs.4, 6). Avoiding said state from exceeding said operational limit depends upon the predetermined

	value set by the controller 24 of the control means 20 (See explanation in claim 1). **Limitations for the base claim are explained in detail in claim 1.**

3. Claims 9-12 and 14 are rejected under 35 U.S.C. 102(b) as being anticipated by conventional prior art figs. 1-2.

Claims:	**Conventional prior art figs. 1-2**
Claims 9 thru 12 and 14:	Applicants' have provided figs. 1-2 as prior arts (see applicants' spec., pages 1-4). The limitations of claims 9-12 and 14 are prior art as they read on to the teaching of applicants' admitted prior art figs. 1-2. In regard to claims 9-10, temperature read on to the thermal load of the motor 51; In regard to claim 11, formula is taught with respect to fig. 1 and associated teaching (see page 2, lines 14-23); In regard to claims 12 and 14, a selected state from parameters read on to current/voltage supplied to the motor 51, temperature read on to the motor thermal load, pressure read on to the pressure associated with the process gas in the chamber or pump pressure, impedance read on to the motor impedance.

Claim Rejections – 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sasaki et al. in view of Mallick, Jr. et al. (4,476,423).

In regard to claim 9, Sasaki et al. do not mention said state is a temperature within the system.

Mallick, Jr. et al. teaches motor temperature detection state (see col. 3, lines 65-68, col. 28, lines 52-56, figs.10-11; motor thermal state, see fig. 9 & col. 27, lines 50-60) of a motor apparatus (starts a pump, see col.35, lines 40-42).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the temperature detection state of Mallick, Jr. et al. in the system of Sasaki et al. because a micro-processor based system have capability to limit and prevent the number of motor starts to protect the motor (see col.1, lines 62-64, col. 2, lines 3-6 & col. 40, lines 37-40).

In regard to claim 10, Sasaki et al. do not mention said state is a function of the thermal load of the motor or drive or the pumping mechanism.

Mallick, Jr. et al. teaches thermal load such as the temperature detection of the motor apparatus (see explanation in claim 9).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have a detected state as a function of thermal load of Mallick, Jr. et al. in the system of Sasaki et al. because a micro-processor based system prevents the number of motor starts to protect the motor (see col.1, lines 62-64, col. 2, lines 3-6 & col. 40, lines 37-40).

Response to Arguments

6. Applicant's arguments filed (see remarks dated 07/20/2010) have been fully considered but they are not persuasive.

After reading the applicants' specification, arguments dated 07/20/10, the non-final office action dated 03/30/10 and the anticipated prior art Sasaki et al., examiner is not convinced of the applicants' arguments for the following reasons.

A thorough explanation of each of the claimed limitations is provided in this final office action for a better understanding of the anticipated prior art Sasaki et al.

Applicants' argue that Sasaki fails to teach "the drive control causes the system to operate for transient periods in an overload condition." As discussed above, Sasaki's vacuum pump is configured to avoid overloading....(see remarks).... However, the drive control of Sasaki's vacuum pump <u>is not programmed to purposefully</u> cause the pump to operate in an overload condition. Such design simply contradicts Sasaki's objective that is to prevent the vacuum pump from being overloaded.

Sasaki et al. teaches a pumping apparatus 12/39/46/62 (see figs.1-6, 8-11), where a pump 14 is driven by a motor 16 and a control means 20 via inverter 22 controls the power supplied to the motor 16 based on detection of the power consumption via a power detector 18 (see figs.1/5).

Sasaki et al. clearly teaches (see figs.4 and 6) that <u>the high speed control operation R2/R4 (see figs.4, 6) causes the power consumption of the pumping apparatus to be in an overloaded state such as when the power consumption is equal to or greater than a predetermined value</u> (vacuum pump becomes overloaded, see col. 4, lines 12-19); <u>High speed operating point R2 causes the power consumption to increase above the highest load region</u> (shown as warning/alarm zone B, see fig. 4); <u>opening control of a pump valve 34 (fig.2) cause the power consumption W to increase to a</u>

higher level such as for example, power consumption increased to point E or any increased power consumption level W corresponding to the higher speed of revolution R4 (see fig.6 & col. 6, lines 5-11) and transient periods in an overload condition read on to the time periods associated with the higher power consumption W corresponding to higher speed operation R4 (see fig.6) or read on to the time periods when said power consumption becomes greater than a predetermined value as set by the controller 24 of the control means 20 (predetermined period of time and predetermined value is set by the controller, see col. 3, lines 35-45; col. 4, lines 19-20). In general, any state such as in the said overload condition have timing associated with it and is set by the controller.

The underlined portion of the statement "Sasaki's vacuum pump is not programmed to purposefully cause the pump to operate in an overload condition", is not in the claim language of claims 1 and 19. As explained above Sasaki et al. teaches a controller 24 of the control means 20 that sets a predetermined value, which is used to detect an overload condition , i.e., when the power consumption is equal to or being greater than the said value, said controls means determines an overload state. The statement purposefully programmed to cause the pump to operate in an overload condition is not in the claim language. In general any controller is programmed with predetermined control variable such as the said predetermined value to monitor an overload condition.

Applicants' further argue that…(see remarks)… In the normal section, Sasaki's vacuum pump is not overloaded. This differs from the claimed invention where the pump operates in the overload condition during the entire transient period. As shown in

FIG. 4 of the application, the vacuum pump operates above the 100% current level for the entire transient period.

Sasaki et al. teaches overloading of the pump apparatus in the time periods associated with the high speed operation R2/R4 (figs.4, 6), for example where the power consumption is above the highest load in a warning/alarm zone B. What considered normal operation, depends upon the application. With respect to Sasaki et al. overloading, (i.e. increased power consumption) occur, when the said consumption is equal to or greater than a preset control value. Sasaki teaches controlling the said power consumption to attain a normal operating level by detecting the said overload condition as explained above. The transient period limitation is explained above.

Applicants' finally argue that...It would not have been obvious......to modify Sasaki into the claimed invention........., the claimed invention is about <u>improving the pump performance by purposefully operating the vacuum pump in an overload condition</u>, whereas Sasaki is about protecting the vacuum pump from being overloaded.......(see remarks, last Para. in page 11).

The above underlined statement "<u>improving the pump performance</u> <u>by purposefully operating the vacuum pump"</u> in an overload condition is not in the claim language. Applicants' invention have an overload condition state (applicants' fig.4) that is when the operating current is above a rated motor current 100% and is shown controlled to attain the said rated normal motor operating current. Sasaki et al. also have an overload condition state, i.e., when the power consumption is greater (correspond to high speed operation R2/R4) than a predetermined value set by the

controller 24 of the control means 20 and is controlled by adjusting the speed to achieve a lower speed R1/R3. Without detecting or monitoring an overload condition (i.e., power consumption level W), it would be impossible to control the operation of the pumping apparatus and Sasaki et al. clearly teaches protection of the pumping apparatus by detecting the power consumption (including the increased power consumption in the overloading state) and thereby achieve an improved pumping apparatus. Examiner has not provided an obvious rejection and has not modified Sasaki et al.'s reference with respect to the limitations of claims 1 and 19 and each limitation is clearly anticipated by the sole teaching by Sasaki et al. Examiner has withdrawn the objection to drawings and claims 1, 13 and 19 based on the respective amendment provided.

Allowable Subject Matter

7. Claim 6 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANTONY M. PAUL whose telephone number is (571)270-1608. The examiner can normally be reached on Mon - Fri, 7:30 to 5, Alt. Fri, Eastern Time.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Benson Walter can be reached on (571) 272-2227. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Walter Benson/
Supervisory Patent Examiner, Art Unit 2837

/Antony M Paul/
Examiner, Art Unit 2837 09/21/2010